

REMARKS/ARGUMENTS

Minor changes are made to this specification. Claims 2, 4, 5 and 8 are amended. New claim 11 is added. Claims 1-11 are pending in the application. Reexamination and reconsideration of the application, as amended, are respectfully requested.

The drawings were objected to because certain reference signs shown in the drawings are not mentioned in the specification. In response, the applicant amends the specification to add descriptions of reference signs 5a, 5b, 7a, 7b, 8a, 8b, 9a, 9b, 11a, 11b, 50, 51 and 52 in Figs. 7 and 8, and a description of reference sign 8 in Fig. 1. No new matter is introduced.

Claim 8 was rejected under 35 U.S.C. §112, second paragraph as being indefinite because the recitation of "...as a result of a previous step" does not specify which preceding step. Accordingly, claim 8 has been amended and is believed to be definite.

Claims 1 and 3' were rejected as being unpatentable over Oikawa Tetsuo [JP 58-032347]. This rejection is respectfully traversed.

As to claim 1, the applicant submits that Tetsuo does not teach the claimed feature "wherein the energy dispersion section is adapted selectively to turn on and off, the slit is disposed in a trajectory of the electron beam dispersed by the energy dispersion section and the electron beam bypasses the slit when the energy dispersion section is turned off." The Examiner acknowledges this, but takes the position that claim 1 is obvious:

Oikawa Tetsuo [JP 58-032347] does not teach that the electron beam bypasses the slit when the energy dispersion section is turned off.

¹ On page 3, the first line under the quotation of §103(a) states: "claims 1- are rejected ...". Page 4, first full paragraph discusses claim 3. The applicant assumes that this rejection applies to claims 1 and 3.

Instead Oikawa Tetsuo [JP 58-032347] teaches that the slit can be removed and the beam can be directed to the image plate during the time the dispersion section is turned off which is equivalent to the electron beam bypassing the slit when the energy dispersion section is turned off. ... Therefore, because these two means of directing a beam of electrons toward a sample while having the slit removed from the trajectory of the beam were art-recognized equivalents at the time the invention was made, one of ordinary skill in the art would have found it obvious to substitute the apparatus for the removal of slit in Oikawa Tetsuo [JP 58-032347] for the means for bypassing the slit when the energy dispersion section is turned off in order to have the sample receive the full dosage of the beam.

The applicant respectfully disagrees, and submits that the Examiner has not established a case of *prima facie* obviousness. "To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations." MPEP §§2142, 2143 (emphasis added). "To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. In re Royka, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). 'All words in a claim must be considered in judging the patentability of that claim against the prior art.' In re Wilson, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970)." MPEP §2143.03.

In the instant case, the Examiner has not cited any reference for teaching the above-quoted limitation of claim 1. For example, claim 1 requires that "the slit is disposed in a trajectory of the electron beam dispersed by the energy dispersion section". In Tetsuo the slit is disposed on the common path of the electron beam with or without energy dispersion. The claim also requires that "the electron beam

bypasses the slit when the energy dispersion section is turned off". In Tetsuo, the electron does not bypass the slit and the slit has to be removed when the energy dispersion section is turned off. The Examiner merely contends that these two configurations are "art-recognized equivalent" but has not shown any evidence in the prior art to support such a contention. The applicant respectfully submits that it would not have been obvious to modify the Tetsuo structure without any teaching or suggestion in the prior art. Accordingly, the applicant submits that claim 1 and dependent claim 3 are patentable over Tetsuo.

Claims 2, 4 and 5² were rejected as being obvious over Oikawa Tetsuo [JP 58-032347] in view of Kundmann [524]. This rejection is respectfully traversed.

The electron microscope recited in claims 2 and 4 include, *inter alia*, an energy filter control unit which is "able to adjust one of the trajectory of electron beam and a position of the slit according to a signal, which is generated as a result of cyclically shifting an area on the slit illuminated by the electron beam and detected by the energy filter electron beam detector." Cyclically shifting the area on the slit illuminated by the electron beam is shown in Figs. 3 (step 121), 4 (step 151), and 5A - 5D, and described in the specification at, for example, page 3, lines 15-20, page 13, lines 23-24 and page 14, lines 20-21 of the specification. The specification states: "Cyclical shifting in this case, for example, refers to shifting of a position of electron beam back and forth relative to the initial position on the slit in a direction of the width of opening." (Page 3, lines 17-20.) Although the descriptions on pages 13 and 14 do not use the word "cyclical", it is clear that the descriptions refer to a cyclical shift since they refer to a period ω . Claims 2, 4 and 5 are amended to more

² Page 4, second full paragraph states: "Claims 2, 4, 10 are rejected ..." but page 5 discusses claim 5. The applicant assumes that this rejection applies to claims 2, 4 and 5.

clearly define this aspect of the invention by inserting the word “cyclically” before the word “shifting”.

The applicant submits that the cited references do not teach or suggest such a cyclic shifting used as a method of adjusting the trajectory of electron beam or a position of the slit. Tetsuo does not teach such an adjustment method. Kundmann teaches an automatic filter adjustment method but it does not involve cyclically shifting the area on the slit illuminated by the electron beam. As shown in Fig. 4 of Kundmann, the coarse zero loss peak alignment is carried out by moving the zero loss peak in one direction, i.e., away from the slit half with higher reading, until the readings on the upper and lower slit halves are equal (Steps 160, 162, 164). As shown in Fig. 5, the fine zero loss peak alignment is carried out by first moving the spectrum stepwise toward the upper slit half until the intensity is zero (Steps 166, 168 and 170), then moving the spectrum stepwise toward the slit opening until the peak has just passed the upper knife edge (Steps 172, 174, 176, 178 and 180, see col. 9, lines 16-29), and then moving the spectrum by an amount (slit width / 2 - 1eV) toward the slit opening (Step 182). Neither the coarse alignment nor the fine alignment method “cyclically shift[s] an area on the slit illuminated by the electron beam” as recited in the present claims 2 and 4. Accordingly, claims 2 and 4 are patentable over Tetsuo in view of Kundmann. Claim 5 depends from claim 4 and is therefore also patentable.

Claims 8-10 were rejected as being obvious over Krivanek [126] in view of Kundmann [524]. Claims 8-10 were also rejected as being obvious over Tsuno [2001/0052744] in view of Kundmann. These rejections are respectfully traversed.

The method recited in claim 8 includes, *inter alia*, a step of “repeating shifting of a position of the selected electron beam on the slit at least once from a first position where the selected electron beam is intercepted by a first shield, via an opening of the slit, to a second position where the selected electron beam is

intercepted again by a second shield". The Examiner acknowledges that Krivanek and Tsuno do not teach or suggest this feature, but contends that Kundmann teaches this feature. The applicant respectfully disagrees.

In Kundmann, the coarse zero loss peak alignment step (Fig. 4) is carried out by measuring the beam current on the upper and lower slit halves, and moving the zero loss peak away from the slit half with higher reading, until the readings on the upper and lower slit halves are equal (Steps 160, 162, 164). Thus, this method moves the zero loss peak from an off-centered position to a centered position but does not move it pass the center position. The above-quoted limitation of claim 8, on the other hand, requires shifting the beam from one side to another side passing the center position of the slit. The coarse alignment step therefore does not disclose the above-quoted limitation of claim 8. The fine zero loss peak alignment in Kundmann (Fig. 5) is carried out by first moving the spectrum stepwise toward the upper slit half until the intensity is zero (Steps 166, 168 and 170), then moving the spectrum stepwise toward the slit opening until the peak has just passed the upper knife edge (Steps 172, 174, 176, 178 and 180, see col. 9, lines 16-29), and then moving the spectrum by an amount ($\text{slit width} / 2 - 1\text{eV}$) toward the slit opening (Step 182). Thus, the zero loss peak is moved from an off centered position to the knife edge and then further to the center position, but is not moved pass the center position. The fine alignment step therefore does not disclose the above-quoted limitation of claim 8.

Accordingly, claim 8 is patentable over Krivanek in view of Kundmann or Tsuno in view of Kundmann. Claims 9 and 10 depend from claim 8 and are therefore also patentable.

Appl. No. 10/620,958
Amdt. Dated February 26, 2004
Reply to Office Action of December 24, 2003

Attorney Docket No. 83394.0009
Customer No.: 26021

Claims 6 and 7 are allowable.³

The art made of record but not relied upon by the Examiner has been considered. However, it is submitted that this art neither describes nor suggests the presently claimed invention.


In view of the foregoing, it is respectfully submitted that the application is in condition for allowance. Reexamination and reconsideration of the application, as amended, are requested.

If for any reason the Examiner finds the application other than in condition for allowance, the Examiner is requested to call the undersigned attorney at the Los Angeles, California telephone number (213) 337-6700 to discuss the steps necessary for placing the application in condition for allowance.

If there are any fees due in connection with the filing of this response, please charge the fees to our Deposit Account No. 50-1314.

Respectfully submitted,

HOGAN & HARTSON L.L.P.

By: 

Dariush Adli

Registration No. 51,386

Attorney for Applicant(s)

Date: February 26, 2004

500 South Grand Avenue, Suite 1900
Los Angeles, California 90071
Phone: 213-337-6700
Fax: 213-337-6701

³ The applicant notes that the Office Action Summary page indicates claims 1-10 as being rejected, but page 11 indicates claims 6 and 7 as being allowable over the prior art of record. No rejection was applied to these claims.